U. S. FOREST SERVICE

RESEARCH NOTE LS-74

LAKE STATES FOREST EXPERIMENT STATION • U. S. DEPARTMENT OF AGRICULTURE

St. Paul Campus, University of Minnesota, St. Paul, Minn. 55101

Botanical and Commercial Range of Black Spruce in the Lake States

Accurate maps showing the distribution of important tree species are valuable to foresters, botanists, wildlife specialists, land managers, and others. Although the general natural ranges for our principal tree species have been well known for some time, new information continues to develop. Commercial ranges, however, have not previously been mapped precisely, and artificial extensions of ranges generally have not been mapped at all. For these reasons, range maps of the principal forest tree species have been prepared[1] for the Lake States (Michigan, Minnesota, and Wisconsin), and that for black spruce (*Picea mariana* (Mill.) B.S.P.) is presented here (fig. 1).

Accuracy depends in part on the scale of the map being used. On this map, it is not practical to separate out isolated stands except when they are some distance from the main range. Accordingly, the main range boundary as drawn may include several outliers near the edge of the principal distribution.

In the silvical characteristics reports for the Lake States tree species,[2] commercial ranges were mapped, but they were based on the following broad definition: "Commercial range is defined as that portion of the natural range in which the species grows to commercial size and is a major or important species in the type." In this Note, commercial range is defined on a wood volume basis and is indicated for each county that presently has at least 1,000 cords of black spruce (fig. 1). Counties with 10,000 to 99,000 cords and those with at least 100,000 cords are specially designated. The commercial range is based primarily on published reports of the Forest Survey, supplemented for completeness by unpublished data from the same source.

The natural range is based on the available published reports[3] as modified by the observations of qualified foresters and botanists.[4] A supplemental map (fig. 2) shows the plots used in making the distribution map. These plots were derived from actual herbarium specimens or from other reliable sources.

Within its natural range in the Lake States, black spruce grows on both mineral and organic soils. Most commonly it grows on peat bogs and muck-filled seepages and stream courses. On the Laurentian Shield in northeastern Minnesota and in a few areas in Upper Michigan it is common on mineral soil sites, usually on gravelly and bouldery loams and shallow soils over bedrock. Pure stands are common on the organic soils and sometimes develop on the mineral soils, also. Under some

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1 *Other published reports in this series are for jack pine (U.S. Forest Serv. Res. Note LS-15, 1963), red pine (U.S. Forest Serv. Res. Note LS-62, 1965), eastern white pine (U.S. Forest Serv. Res. Note LS-63, 1965), and white spruce (U.S. Forest Serv. Res. Note LS-73, 1965).*

2 *See Lake States Forest Experiment Station, Station Paper 67, which includes a list of silvical reports.*

3 *Dodge, C. K., Miscellaneous papers on the botany of Michigan, Publ. 31, Biol. Series 6, Mich. Geol. and Biol. Survey, 1921. Fassett, Norman C., Preliminary reports on the flora of Wisconsin, V. Coniferales, Wis. Acad. Sci., Arts and Letters, Trans. 25: 177-182, illus., 1930. Heinselman, M. L., Silvical characteristics of black spruce, U.S. Forest Serv., Lake States Forest Expt. Sta., Sta. Paper 45, 30 pp., illus., 1957.*

4 *Information in this Note has been reviewed by Drs. Edward Flaccus and Paul Monson, University of Minnesota (Duluth); Dr. Thomas Morley, University of Minnesota, (Minneapolis); Dr. Edward G. Voss, University of Michigan; Dr. John W. Andresen, Southern Illinois University; staff members of all Divisions and Field Stations of the Lake States Forest Experiment Station; and staff members of the National Forests and State Conservation Departments in Michigan, Minnesota, and Wisconsin.*

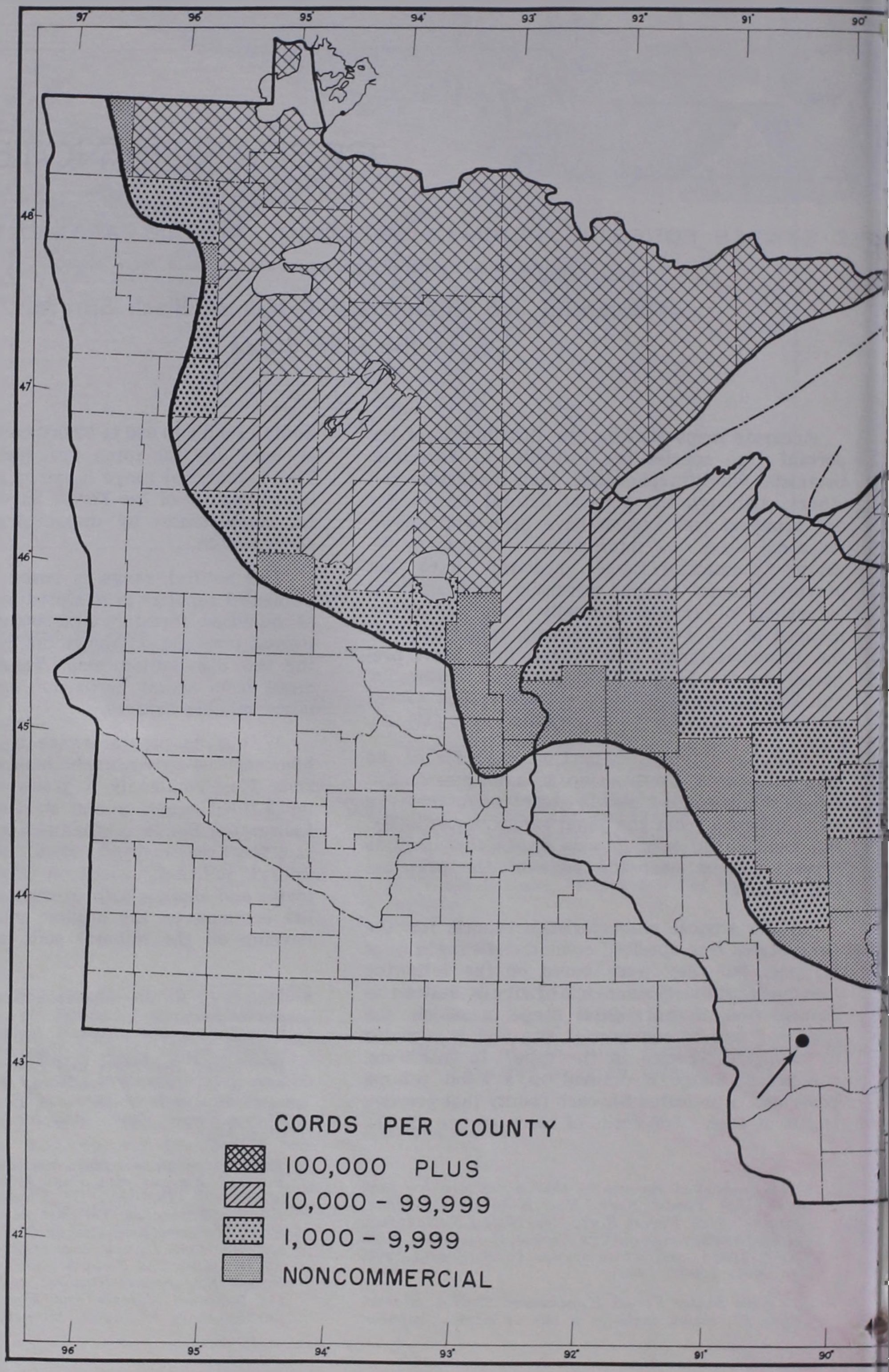
97°
96°
95°
94°
93°
92°
91°
90°
48°
47°
46°
45°
44°
43°
42°
CORDS PER COUNTY
100,000 PLUS
10,000 - 99,999
1,000 - 9,999
NONCOMMERCIAL
96°
95°
94°
93°
92°
91°
90°

FIGURE 1. – spruce ir cludes th to isolated stand that is some distance main range. The commercial range includes all counties within the natural range that have at least 1,000 cords of black spruce.

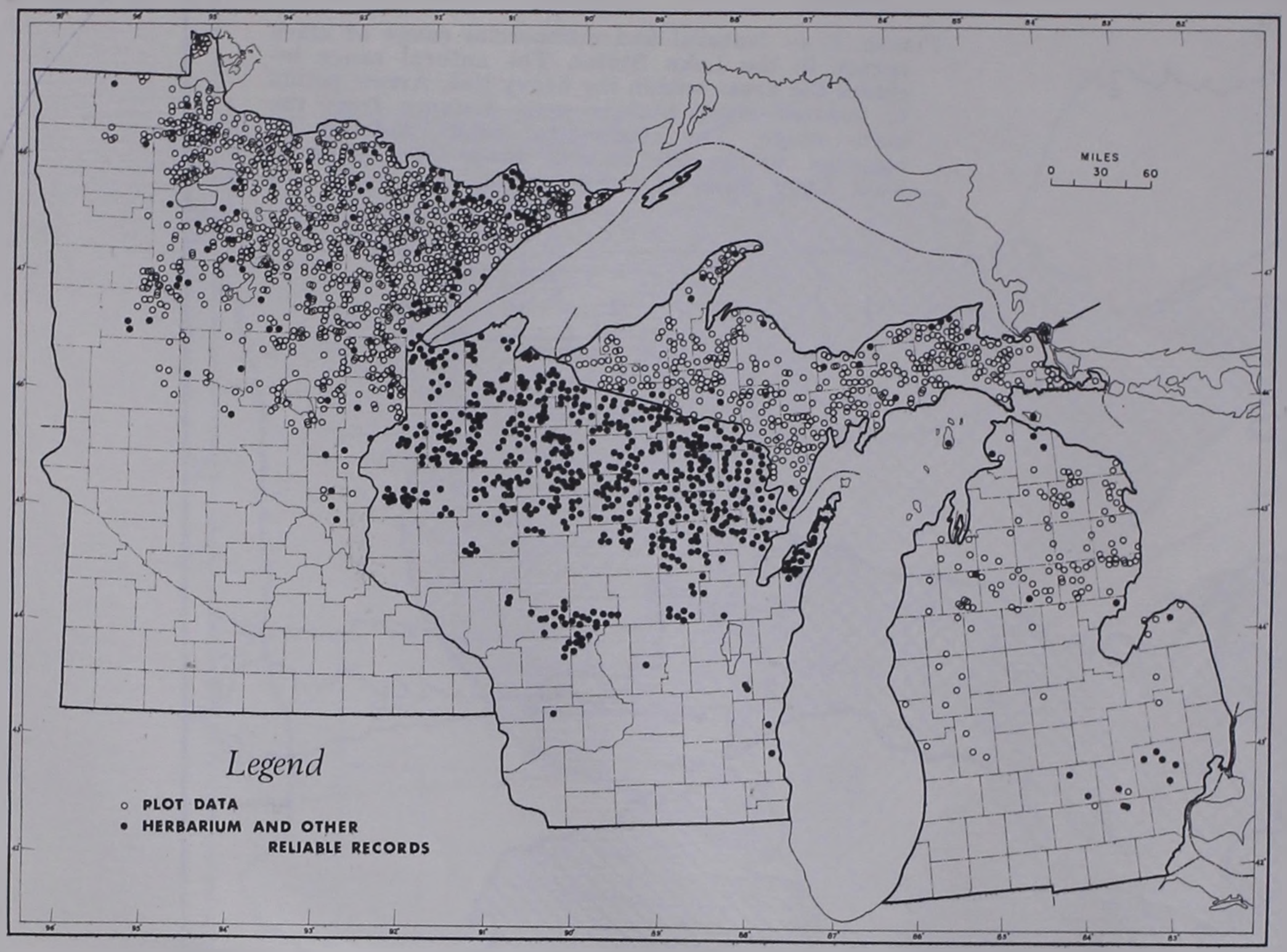

FIGURE 2. — Localities from which native black spruce is represented in established herbaria or other valid records.*

* Includes material from (1) the following herbaria: Cranbrook Institute of Science, Michigan State University, Milwaukee Public Museum, University of Michigan, University of Minnesota (Duluth), University of Minnesota (Minneapolis), University of Wisconsin (Madison), and University of Wisconsin (Milwaukee); (2) seed collection records of the Lake States Forest Experiment Station, the University of Minnesota, and Michigan State University; (3) superior tree records of the Lake States Forest Experiment Station; (4) seed production areas on record at the Lake States Forest Experiment Station; (5) a vegetational survey made by Dr. Egolfs Bakuzis of the University of Minnesota; and (6) Fassett, 1930 (see footnote 3), for most of the Wisconsin locations.

bog conditions extensive pure stands of stunted trees, often over 100 years old, may develop. Frequently, however, black spruce grows with one or more associates, the most common of which (in approximate order of frequency on Forest Survey plots) in the Lake States are balsam fir, tamarack, northern white-cedar, paper birch, quaking aspen, white spruce, eastern white pine, red maple, jack pine, and yellow birch. Associates vary geographically and according to site conditions. For example, in Michigan sugar maple and eastern hemlock are fairly common associates, in addition to the other species listed. On bogs, tamarack is the most common associate.

The natural distribution of black spruce is outlined on the map. Planting of black spruce has not been extensive, although it is increasing. There is little probability, however, that artificial regeneration in the Lake States will blur the outlines of the natural range in the forseeable future, as it may for white spruce and the pines.

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PAUL O. RUDOLF
Principal Silviculturist

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